



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/851,795	05/09/2001	Anthony P. Gold	TN225	3307

UNISYS Corporation
Unisys Way, MS/E8-114
Blue Bell, PA 19424-0001

7590 04/08/2004

EXAMINER

DANG, KHANH NMN

ART UNIT	PAPER NUMBER
----------	--------------

2111

DATE MAILED: 04/08/2004

8

Please find below and/or attached an Office communication concerning this application or proceeding.

8

Office Action Summary

Applicant(s)

09/851,795

Applicant(s)

GOLD ET AL.

Examiner

Khanh Dang

Art Unit

2111

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5, 8, 9-14, 17, 20, 21, 28-31, 36, 38-43, 46 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 6, 7, 15, 16, 18, 19, 22-27, 32-35, 37, 44, 45 and 47-52 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 5, 8, 10, 12, 13, 14, 17, 20, 21, 28-33, 36, 38-43, and 46 are rejected under 35 U.S.C. 102(b) as being anticipated by Larson et al.

At the outset, it is noted that similar claims will be grouped together to avoid repetition in explanation.

As broadly drafted, these claims do not define any structure/step that differs from Larson et al. With regard to claims 1, 8, 10, Larson discloses a multiple processor computer system comprising: a plurality of processors (62 (1-N)); a shared resource (72/72', for example); a main memory (74, for example), at least a portion thereof comprising a control structure for controlling a lock on said shared resource; and a crossbar structure (spinlocks 104/110/112/hash table 80) for controlling access among the processors to the shared resource, the crossbar structure (spinlocks 104/hash table 80) comprising, for each processor, a corresponding storage location (90/102, for

Art Unit: 2111

example), one of the plurality of processors ($62(1-N)$) writing to a storage location corresponding to the one processor, an address of the lock control structure associated with said shared resource to acquire the lock thereto, the crossbar structure (spinlocks 104/110/112/hash table 80), on behalf of the one processor, performing memory operations on the lock control structure at the address specified in the corresponding storage location in order to acquire the lock on behalf of the one processor. With regard to claim 2, the crossbar structure (spinlocks 104/110/112/hash table 80) further comprises a second storage location (any other correspondent 90/102) corresponding to a respective processor (any other processor ($62(1-N)$)) in the multi-processor system, one of the plurality of processors writing to the corresponding second storage location an address of the lock control structure associated with said shared resource to release the lock thereto, the crossbar structure, on behalf of the processor, performing memory operations on the lock control structure at the address specified in the corresponding second storage location in order to release the lock on behalf of the processor. With regard to claim 5, the crossbar structure further comprises a queue (represented by a plurality of tables/pointers) for determining which processor is granted a lock. With regard to claim 12, it is clear that the shared memory includes a register. With regard to claims 13, 14, 17, see above. With regard to claims 20, 21, 28-33, 36, 38-43, and 46, one using the apparatus of Larson et al. would have performed the same step/instruction set forth in claims 20, 21, 28-33, 36, 38-43, and 46.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Larson et al.

Larson et al., as explained above, discloses the claimed invention. Larson et al. does not disclose that "at least two processors" can be placed in a board or "module." It would have been obvious to one of ordinary skill in the art at the time the invention was made to place at least two processors of Larson et al. in a board or "module", since such a modification is only a matter of design choice and clearly within the level of skill in the art. If Applicants choose to challenge the fact that a plurality of processors can be commonly placed on board(s) or module(s), supportive documents will be provided upon request.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Larson et al. in view of Henriksen.

Larson et al., as explained above, discloses the claimed invention. Larson et al. does not disclose use of a shared I/O. Henriksen discloses the use of a shared I/O for a plurality of processors. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide Larson et al. with a shared I/O, as taught by

Henriksen, for the purpose of extending the capability of the system of Larson et al. by supplying it with a peripheral or I/O resource shared by a plurality of processors.

Response to Arguments

Applicants' arguments filed 2/5/2004 have been fully considered but they are not persuasive.

At the outset, Applicants are reminded that claims subject to examination will be given their broadest reasonable interpretation consistent with the specification. *In re Morris*, 127 F.3d 1048, 1054-55 (Fed. Cir. 1997). In fact, the "examiner has the duty of police claim language by giving it the broadest reasonable interpretation." *Springs Window Fashions LP v. Novo Industries, L.P.*, 65 USPQ2d 1862, 1830, (Fed. Cir. 2003). Applicants are also reminded that claimed subject matter not the specification, is the measure of the invention. Disclosure contained in the specification cannot be read into the claims for the purpose of avoiding the prior art. *In re Sporck*, 55 CCPA 743, 386 F.2d, 155 USPQ 687 (1986).

With this in mind, the discussion will focus on how the terms and relationships thereof in the claims are met by the references. Response to any limitations that are not in the claims or any arguments that are irrelevant and/or do not relate to any specific claim language will not be warranted.

With regard to claims 1, 13, 20, 28, and 38, Applicants argued that "Larson does not disclose or suggest a "crossbar structure" and that "Larson, in contrast, discloses microprocessor 52 performing spinlocks." Contrary to Applicants' argument, spinlocks

104/110/112/hash table 80 define the so-called "crossbar structure." As disclosed by Larson, the hash table 80 is configured to reduce lock contention through a combination of techniques: using lightweight spinlocks for synchronization; locking buckets in addition to, or rather than, the whole table; and partitioning items among multiple subtables. The hash table 80 uses two levels of locks: a table lock 110 and a bucket lock 112 for each bucket. The locks are implemented as spinlocks. The table lock 110 protects access to table-wide data like the split pointer, various counters, and the directory of segments. The lower level bucket lock 112 serializes all operations on items in a particular bucket. The two-tiered lock mechanism provides fine-granularity locking and greatly reduces lock contention. It is clear that the table lock (of hash table 80), not microprocessor 52, performs the spinlocks.

Allowable Subject Matter

Claims 3, 4, 6, 7, 15, 16, 18, 19, 22-27, 32-35, 37, 44, 45, 47-52 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication should be directed to Khanh Dang at telephone number 703-308-0211.



Khanh Dang
Primary Examiner